

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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In re Scotts EZ Seed Litigation

12-CV-4727 (VB)

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**MEMORANDUM OF LAW IN SUPPORT OF
DEFENDANTS' MOTION TO EXCLUDE PLAINTIFFS'
PROFFERED EXPERT DOUGLAS E. KARCHER**

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TABLE OF CONTENTS

	<u>Page</u>
I. BACKGROUND	2
A. Dr. Karcher’s Trial	3
B. Dr. Karcher’s Critiques of Scotts’ Trials.	6
II. ARGUMENT	7
A. Legal Standard.	7
B. Dr. Karcher’s Grass Seed Trial Should Be Precluded Because the Conclusions Are Not Grounded in Reliable Scientific Methods.	9
1. Systemic Failure of Controls Invalidates Dr. Karcher’s Trial.	9
a. Dr. Karcher Did Not Verify the Grass Seed in the Single Package of EZ Seed Dr. Karcher Planted Was Even Still Viable.	10
b. Dr. Karcher’s Trial Compared a Version of EZ Seed Not Intended to Be Grown in Arkansas Against Ordinary Seed Containing Mostly a Species Ideally Suited to Arkansas’ Climate.	13
c. Dr. Karcher Introduced, but Failed to Control for, Numerous Other Confounding Variables.	15
C. Dr. Karcher’s Study Fails to Test the Claim at Issue.	16
1. Dr. Karcher’s Watering Methodology Was Flawed, and Did Not Accurately Represent “Keeping the Soil Moist” or Half That Amount. ...	17
2. Dr. Karcher Failed to Test EZ Seeds’ Performance Versus Ordinary Seed.	18
D. Dr. Karcher Did Not Test EZ Seed According To Its Directions For Use.	21
E. Dr. Karcher’s Critique of Scotts’ Trials Improperly Rely on ETo, Including Grossly Unreliable ETo Estimations.	22
F. Dr. Karcher’s Trial Is So Flawed That Its Relevance Is Substantially Outweighed by The Prejudicial Effect It Would Have On A Jury.	24
III. CONCLUSION	25

TABLE OF AUTHORITIES

	Page(s)
CASES	
<i>Amorgianos v. National R.R. Passenger Corp.</i> , 303 F.3d 256 (2d Cir. 2002).....	8
<i>Auto Indus. Supplier ESOP v. Ford Motor Co.</i> , 435 F. App'x 430 (6th Cir. 2011)	8
<i>Brooks v. Outboard Marine Corp.</i> , 234 F.3d 89 (2d Cir. 2000).....	13
<i>Daubert v. Merrell Dow Pharms., Inc.</i> , 509 U.S. 579 (1993).....	passim
<i>In re Paoli R.R. Yard PCB Litig.</i> , 35 F.3d 717 (3d Cir. 1994).....	8
<i>In re Pfizer Inc. Sec. Litig.</i> , 2016 WL 1426211 (2d Cir. Apr. 12, 2016)	7, 8
<i>Kumho Tire Co. v. Carmichael</i> , 526 U.S. 137 (1999).....	7, 8
<i>MTX Commc'ns Corp. v. LDDS/WorldCom, Inc.</i> , 132 F. Supp. 2d 289 (S.D.N.Y. 2001).....	8
<i>SNAPP Sys., Inc. v. Ford Motor Co.</i> , 2008 WL 5383372 (E.D. Mich. Dec. 23, 2008)	8
<i>Washburn v. Merck & Co., Inc.</i> , 213 F.3d 627 (2d Cir. 2000).....	8
<i>Wills v. Amerada Hess Corp.</i> , 379 F.3d 32 (2d Cir. 2004).....	10
OTHER AUTHORITIES	
BLACK'S LAW DICTIONARY 1547 (10th ed. 2014)	9
Fed. R. Evid. 403	25
Fed. R. Evid. 702	7, 8
Federal Judicial Center's Reference Manual on Scientific Evidence	9

Defendants The Scotts Miracle-Gro Company and The Scotts Company LLC (collectively, “Scotts”) move to exclude the grass seed trial and opinions of Plaintiffs’ proffered grass seed expert, Douglas Karcher, as well as other opinions offered in his report. Plaintiffs seek to rely on Dr. Karcher to disprove the 50% Thicker claim,¹ which was on the Scotts® Turf Builder® EZ Seed® product (“EZ Seed”).

Dr. Karcher ran a single grass-seed trial in Arkansas, which failed at the most fundamental level of experimental design, rendering it scientifically unreliable and inadmissible. Specifically, Dr. Karcher tested only a single bag of EZ Seed, yet he did nothing to confirm the viability of the seed in that lone package – invalidating all his conclusions. He also failed to control for differences in the variety of seed being tested. Instead, Dr. Karcher’s test used an EZ Seed flavor not sold in Arkansas because the seed is poorly adapted to Arkansas, and is instead intended for use in northern climates. He then compared that northern EZ Seed with an “ordinary” seed mix containing vastly different species, including predominately tall fescue, a grass species ideally suited for establishment in Arkansas. Dr. Karcher’s failure to establish the viability of the single bag of EZ Seed he used, and his decision to compare it to entirely different species of grass seed, render his trial and the related conclusions entirely unreliable.

In addition to ignoring necessary controls, Dr. Karcher also failed to test the claim at issue. Specifically, Dr. Karcher deviated from the literal language of the claim, with absolutely no evidence or support that a consumer would interpret the claim as he tested it. The 50% Thicker claim compares EZ Seed to “ordinary seed.” Dr. Karcher agrees that “ordinary seed” means seed **without** mulch and fertilizer. Yet his test compares EZ Seed to seed **with** mulch and

¹This claim reads in full: “50% thicker with half the water** **Versus ordinary seed when each was watered at half the recommended rate. Results may vary.” (the “50% Thicker claim”)

fertilizer, *i.e.*, **not** ordinary seed. He also blatantly ignored the planting instructions on EZ Seed, failing to give the product a deep and thorough initial watering as directed.

Dr. Karcher's use of reference Evapotranspiration ("ETo") in his trial and his report to represent the amount of water needed to keep the soil moist is equally problematic. ETo is an estimate of water lost to the atmosphere from a hypothetical surface entirely covered by a uniform, dense layer of actively growing plants; for example, a fully established lawn. During the seed establishment phase at issue, however, the soil is generally bare, and certainly is not covered in a uniform, dense layer of actively growing plants. ETo therefore unquestionably underestimates the amount of water lost from the surface of the bare soil in a seeding project. As a result, Dr. Karcher's trial was under-watered. Likewise, his opinions that Scotts over-watered EZ Seed in its trials are unreliable because those opinions are also inappropriately based on ETo. And even if ETo were somehow appropriate, Dr. Karcher's method for determining ETo with regard to the Scotts trials was not. He relied on an internet database of 30-year average ETo, entirely divorced from the actual conditions of the trials he was critiquing.

The critical flaws in Dr. Karcher's opinions cut to the very core of their reliability. Moreover, Dr. Karcher's test, at best, proves that a single bag of a single variety of possibly dead EZ Seed, planted in the wrong state, did not grow 50% thicker with half the water as compared to *ordinary seed plus fertilizer and mulch* planted in its ideal environment. That is not the claim on the package or at issue in this case. Dr. Karcher's opinions should be excluded.

I. BACKGROUND

Plaintiffs proffer Dr. Douglas Karcher, Ph.D. of the University of Arkansas, as an expert witness on the subject of turfgrass. Dr. Karcher's report offers opinions on the validity of the 50% Thicker Claim based on his own [REDACTED]

A. Dr. Karcher's Trial

On or about August 17, 2015, Dr. Karcher went shopping at both Home Depot and Lowe's in Arkansas to purchase seed to use in a trial, nominally, to test the validity of the 50% Thicker claim. (Ex. 93; Ex. 20 at 138:13-22.)² Dr. Karcher had been asked to test only the Sun & Shade "flavor" of EZ Seed, but soon discovered that neither the Home Depot nor the Lowe's he visited carried EZ Seed Sun and Shade. (Ex. 93; Ex. 20 at 138:13-22.) Dr. Karcher's inability to locate Sun and Shade was not bad luck; Scotts does not distribute EZ Seed Sun and Shade in Arkansas because the species of grasses in the mix are poorly adapted to the climate in the region. (Ex. 40 at ¶¶ 7-9.) Rather than purchasing EZ Seed Tall Fescue or EZ Seed Bermudagrass, both of which were available on the shelves where he went shopping and are well adapted to growth in Arkansas, Dr. Karcher left the stores empty-handed and, rather than asking Scotts for samples, mail-ordered a single package of EZ Seed Sun and Shade from an unknown supplier on Amazon.com. (Ex. 93; Ex. 20 at 138:23-139:3, 139:25-140:9.) Dr. Karcher made no attempt to determine if the EZ Seed he ordered was intended for use in Arkansas. (Ex. 20 at 139:18-21.)

Even though it is [REDACTED] to compare grass seed products (Ex. 20 at 127:24-128:4), Dr. Karcher ordered a single package of a different product, Pennington Smart Seed Sun and Shade, to represent the "ordinary seed" in his trials. (Ex. 20 at 141:25-142:3.)

Although both the EZ Seed and the Pennington product purchased by Dr. Karcher were labeled as “sun and shade,” the seed in the products was dramatically different. (See Ex. 9 at

² All motion exhibits are attached to the Omnibus Declaration of Shawn Patrick Regan.

¶66; Ex. 19 at Ex. B at 10-11.) The seed component of the Scotts EZ Seed comprised approximately 27.8% Kentucky bluegrass, 30% perennial rye, and 42.2% creeping red fescue; all species adapted to cooler, northern climates. (Ex. 19 at Ex. B at 11; Ex. 9 at ¶66.) By contrast, Dr. Karcher's "ordinary seed" contained 73.5% tall fescue (a species adapted to hotter, southern climates) and only 9.6% Kentucky bluegrass, 7.3% red fescue, and 7.3% chewings fescue. (Ex. 19 at Ex. B at 10.)

Dr. Karcher devised a protocol to test the 50% Thicker claim using only these two packages of seed. (Ex. 19 at Ex. B at 10-11.) In initiating his trial, Dr. Karcher selectively followed the instructions on both packages. (Ex. 20 at 180:17-19 [REDACTED]
[REDACTED] For EZ Seed, Dr. Karcher followed all of the directions, except the deep and thorough initial watering identified on his EZ Seed package as the "key to success." (See generally Ex. 19 at Ex. B; Ex. 67; Ex. 20 at 182:13-18 [REDACTED]
[REDACTED])

To plant "ordinary seed" – which the experts agree means seed *without* mulch and fertilizer – Dr. Karcher applied seed, *and then added mulch and fertilizer*. (See, e.g., Ex. 20 at 168:23-169:1 [REDACTED]
[REDACTED]), 169:18-20 (" [REDACTED]
[REDACTED]"); Ex. 19 at Ex. B; Ex. 9 at ¶ 43; Ex. 10 at 218:21-219:6.) The package of the "ordinary seed" used by Dr. Karcher does not direct, or even recommend, applying a mulch. (Ex. 20 at 179:6-19.) Dr. Karcher also deviated from the stated application rate on the ordinary seed by applying the seed on a "pure

live seed” basis as opposed to the weight recommended in the instructions.³ (Ex. 20 at 173:18-174:18.)

Once planted, Dr. Karcher employed three different watering regimens for his test: (1) full water, (2) half volume, and (3) half frequency regimen. (Ex. 19 at Ex. B.) Each regimen was based on his calculations of reference ET, also known as ETo, from data from a weather station relatively close to his trial location. (Ex. 19 at Ex. B.) Evapotranspiration, or ET, represents the amount of water lost to the atmosphere through evaporation (the loss of water from a soil surface) and transpiration (the loss of water from a plant’s leaves). (Ex. 94 at 1.) ETo, the estimate used by Dr. Karcher, is different. It represents not the actual water losses, but a standardized estimate of water losses assuming a dense, uniform, actively growing cover of plants. (See Ex. 94 at 2-3; Ex. 9 at ¶¶ 28-29; Ex. 69 (“The reference surface closely resembles an extensive surface of green, well-watered grass of uniform height, actively growing and completely shading the ground.”).) The assumed plant cover significantly lowers the estimated rate of water loss that would otherwise occur from bare soil. (Ex. 9 at ¶¶ 28-29.) The exact difference is highly fact specific, but losses from bare soil can be more than 20% higher than from surfaces covered with plants. (Ex. 9 at ¶¶ 27.) Dr. Karcher admitted that he did not know the exact relationship between ETo and bare soil ET, and did nothing to calculate the bare soil ET for his trial or his critique of the Scotts trials discussed below. (Ex. 20 at 105:2-15, 108:7-12.)

In his trial, Dr. Karcher’s full water regimen – intended to represent the recommended watering rate – applied 100% of ETo daily after the initial watering. (Ex. 19 at Ex. B at 2; Ex.

³ “Pure live seed” accounts for the purity and germination rate of seed to calculate the percentage of a product that is expected to be a living, viable grass seed, as opposed to dead seed or inert material. For example, a seed sample that is 90% pure, and has a germination rate of 90% would be 81% pure live seed (0.9 x 0.9). Here, a rough calculation shows that Dr. Karcher would have applied approximately 6.8 pounds of “ordinary seed” as opposed to the 6 pound application rate specified in the instructions. (See Ex. 42.)

equation, its raw data, nor the even the location of the weather station that generates the raw data. (See Ex. 95; Ex. 20 at 287:16-288-15.) Dr. Karcher does not know the accuracy or reliability of the Rainmaster.com ET data, any of the assumptions that went into the estimates, or even what raw data that was used. (Ex. 20 at 114:2-115:16.)

II. ARGUMENT

A. **Legal Standard.**

Federal Rule of Evidence 702, controls admissibility of expert testimony and provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based on sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Fed. R. Evid. 702. In *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), the Supreme Court held that Rule 702 imposes a “gatekeeping” obligation on the trial court to exclude evidence that is not either not “relevant” or not “reliable.” 509 U.S. at 589; *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999). Plaintiffs bear “the burden to establish admissibility.” *In re Pfizer Inc. Sec. Litig.*, 2016 WL 1426211, at *14 (2d Cir. Apr. 12, 2016).

Daubert sets forth five factors the court may consider to determine reliability: (1) whether the expert’s technique or theory can be and has been tested, (2) whether the technique or theory has been subjected to peer review and publication, (3) the known or potential rate of error of the technique when applied, (4) the existence and maintenance of standards and controls, and (5) whether the technique or theory is generally accepted in the scientific community. *Daubert*, 509 U.S. at 593-94. The court’s inquiry under *Daubert* is flexible. *Id.* at 594. These factors are not a definitive test or checklist but are merely instructive. *Id.* at 593; *Kumho*, 526 U.S. at 150. As one court has explained:

Essentially, *Daubert* and *Kumho* require a two-step inquiry that involves an analysis of the “relevance and the reliability” of an expert’s opinion. The relevance step of the inquiry is designed to ensure that “there is a ‘fit’ between the testimony and the issue to be resolved by the trial.” The reliability step focuses on the “methodology and principles” that form the basis for the testimony. A trial court must inquire as to whether the methodology underlying the proffered expert testimony is valid and whether the methodology may be properly applied to the facts at issue in a particular case.

SNAPP Sys., Inc. v. Ford Motor Co., 2008 WL 5383372, at *2 (E.D. Mich. Dec. 23, 2008) (citations omitted), *aff’d sub nom. Auto Indus. Supplier ESOP v. Ford Motor Co.*, 435 F. App’x 430 (6th Cir. 2011); *see also MTX Commc’ns Corp. v. LDDS/WorldCom, Inc.*, 132 F. Supp. 2d 289, 291 (S.D.N.Y. 2001). “[W]hen an expert opinion is based on data, a methodology, or studies that are simply inadequate to support the conclusions reached, *Daubert* and Rule 702 mandate the exclusion of that unreliable opinion testimony.” *Amorgianos v. Nat’l R.R. Passenger Corp.*, 303 F.3d 256, 266 (2d Cir. 2002).

The flexible *Daubert* inquiry gives the district court the discretion needed to ensure that the courtroom door remains closed to junk science while admitting reliable expert testimony that will assist the trier of fact. To warrant admissibility, however, it is critical that an expert’s analysis be reliable at every step. As Chief Judge Becker of the Third Circuit has explained, the *Daubert* “requirement that the expert testify to scientific knowledge—conclusions supported by good grounds for each step in the analysis—means that any step that renders the analysis unreliable under the *Daubert* factors renders the expert’s testimony inadmissible.”

Id. at 267 (citing *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 745 (3d Cir. 1994)); *see also Washburn v. Merck & Co., Inc.*, 213 F.3d 627 (2d Cir. 2000) (affirming the district court’s rejection of expert testimony relying on largely anecdotal studies with insufficient controls).⁴

⁴ The Second Circuit’s recent decision in *Pfizer* allows a court only to strike parts of an expert report if what remains is valid expert testimony. *Pfizer*, 2016 WL 1426211, at *21. *Pfizer* is inapplicable here because, as demonstrated, all of Karcher’s opinions are unreliable.

B. Dr. Karcher's Grass Seed Trial Should Be Precluded Because the Conclusions Are Not Grounded in Reliable Scientific Methods.

Dr. Karcher's grass-seed trial fails the *Daubert* admissibility standard because Dr. Karcher failed to follow basic scientific method, rendering his results unreliable and irrelevant.

1. Systemic Failure of Controls Invalidates Dr. Karcher's Trial.

"[T]o qualify as 'scientific knowledge,' an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation—i.e., 'good grounds,' based on what is known." *Daubert*, 509 U.S. at 590. The "scientific method" is defined as "the process of generating hypotheses and testing them through experimentation, publication, and replication." BLACK'S LAW DICTIONARY 1547 (10th ed. 2014). As explained in the Federal Judicial Center's Reference Manual on Scientific Evidence:

A good study design compares outcomes for subjects who are exposed to some factor (the treatment group) with outcomes for other subjects who are not exposed (the control group).... [D]ata from a treatment group without a control group generally reveal very little and can be misleading. Comparisons are essential.... Observational studies succeed to the extent that the treatment and control groups are comparable – apart from the treatment.... There are ... some basic questions to ask when appraising causal inferences based on empirical studies: Was there a control group? Unless comparisons can be made, the study has little to say about causation.

(Ex. 55 at 218-19, 220, 222; *see also* Ex. 70 at n.47 ("The design of a controlled experiment is intended to create a situation in which a statistically significant difference between the test group and the control group would warrant an inference of causation.").)

Basic scientific methods dictate that a test should have only one independent variable. As that independent variable is changed, the response of the dependent variable (the factor or trait to be measured) may be observed. (*See, e.g.*, Ex. 71 ("The observation of the independent variable A should, if the hypothesis is correct, always lead to the observation of B, the expected outcome.").) All other variables that may influence the dependent variable, *i.e.*, confounding

variables, must be controlled so that any change in the dependent variable may be reliably attributed to changes in the independent variable. (*See, e.g.*, Ex. 72 (“Extraneous variables which themselves systematically influence the dependent variable, and create the illusion of a cause-effect relationship between an independent and dependent variable, are called confounding variables, or sometimes merely confounds or confounders.”). If confounding variables are not controlled, it is impossible to know what is causing the result. For example, in *Wills v. Amerada Hess Corp.*, 379 F.3d 32, 50 (2d Cir. 2004), the Second Circuit affirmed exclusion of expert testimony that a plaintiff’s cancer was caused by exposure to toxic chemicals such as benzene and PAHs, because he failed to account for smoking and alcohol consumption which could also have caused the cancer at issue. The expert’s failure to account for these additional variables, “strongly indicated that [the expert’s] conclusions were not grounded in reliable scientific methods, as required by *Daubert*.” (*Id.*) Dr. Karcher himself put it best: “ [REDACTED] ” (Ex. 19 at 17.)

a. Dr. Karcher Did Not Verify the Grass Seed in the Single Package of EZ Seed Dr. Karcher Planted Was Even Still Viable.

Grass seed is a living organism that can die or otherwise lack viability. (*See, e.g.*, Ex. 20 at 59:22-60:8.) Despite this fact, Dr. Karcher tested only a single package of EZ Seed that he mail ordered from an unknown vendor on Amazon.com.

Dr. Karcher’s experimental design failed to account for the possibility of non-viable seed. His test included three different watering treatments: a full watering treatment to serve as a control, a half the volume treatment, and a half volume and half frequency treatment. (Ex. 19 at Ex. B at 2-3.) The full water control was [REDACTED]

[REDACTED] (Ex. 19 at 9.) Yet, Dr.

Karcher never applied the full watering regimen to EZ Seed. This destroys the scientific reliability of Dr. Karcher's trial for a number of reasons.

First, Dr. Karcher failed to prove that the single package of EZ Seed he elected to test was representative of the overall performance of EZ Seed, or even viable:

[REDACTED]

(Ex. 20 at 126:18-127:18.)

Any number of factors could cause the seed in a single package of a product to be damaged or destroyed. (Ex. 9 at 59-60.) For example, shipped packages are often exposed to extreme temperatures, which in the case of a living organism could cause irreparable harm. Dr. Karcher himself admitted that he did not know how the seed was handled prior to delivery, and agreed that temperature and age can result in seed death or a reduction in germination. (Ex. 20 at 139:18-23, 59:22-60:8.) Had Dr. Karcher simply watered a test plot of EZ Seed with the same control watering regimen that some of the "ordinary" seed was already going to receive – known as a "positive control" – he could have stated with certainty that the single package of EZ Seed

he tested was not a random dud.⁵ Inexplicably, Dr. Karcher chose not to do so. As a result, Dr. Karcher does not even know if the seed in the single package of EZ Seed he tested was still viable. As such, he cannot reliably conclude that his EZ Seed results are representative of EZ Seed generally, nor that EZ Seed will not grow 50% Thicker With Half the Water across all conditions and “flavors.”

Potentially non-viable seed is not the only reason Dr. Karcher’s failure to include a positive control guts the validity of his trial. Additionally, the EZ Seed Dr. Karcher planted was never intended to be sold in Arkansas. (*See infra.*) Even assuming the EZ Seed was viable, since it was never watered at the full rate, there is no evidence that the particular mix of seed in the package of EZ Seed Dr. Karcher planted – whether mixed with coir mulch and fertilizer or not – was capable of growing in his testing location and conditions, regardless of the specific amount of water it received.⁶ Dr. Karcher included a full water control of ordinary seed to address this very issue. (Ex. 19 at 9 [REDACTED])

[REDACTED].) Dr. Karcher included no such control for seed in the EZ Seed, and therefore cannot use his trial to reach any conclusions on the general performance of EZ Seed in intended climates.

No reasonable scientist would rely on the results of a single test, of a single sample of unknown origins, of a single product, without a positive control, to reach definitive conclusions about the performance of that product under those same conditions, let alone generalize those

⁵ Scotts prides itself on the quality of its products, but because grass seed is a living organism, mistreatment (even before planting) or manufacturing issues could lead to dud packages. Scotts’ No-Quibble Guarantee would cover any such damaged products. (Ex. 100 at ¶¶ 4-8.)

⁶ At deposition, Dr. Karcher opined that [REDACTED]. (Ex. 20 at 218:7-13.) This simply demonstrates importance of a positive control. Dr. Karcher assumes, but cannot know, that some unidentified flaw in EZ Seed prevented germination, as opposed to damage to the seed prior planting.

results to different products under different conditions. (*See* Ex. 9 at 63.) Dr. Karcher did just that, and his opinions should be excluded.⁷

b. Dr. Karcher's Trial Compared a Version of EZ Seed Not Intended to Be Grown in Arkansas Against Ordinary Seed Containing Mostly a Species Ideally Suited to Arkansas' Climate.

Dr. Karcher could have mitigated the impact of his failure to include a positive control, by comparing EZ Seed to seed from the same seed lot in the package he purchased. In other words, Dr. Karcher could have sorted seed from the other components (mulch and fertilizer) in the EZ Seed (or simply asked Scotts to provide samples) and tested it against the complete EZ Seed product. Had he done so, he would have had at least a chance to isolate the cause of any difference in growth attributable to the nature of the EZ Seed products, as opposed to the differences in the seed components.⁸ But that is not what Dr. Karcher did.

Instead, Dr. Karcher compared a predominately different group of grass species. Specifically, Dr. Karcher tested EZ Seed comprising predominately Kentucky bluegrass, creeping red fescue, and perennial ryegrass to "ordinary seed" comprising predominately Tall Fescue. (Ex. 19 at Ex. B at 10-11.) Because Dr. Karcher cannot isolate whether the difference in performance was attributable to the different species planted, or the difference between the EZ Seed product and the ordinary seed, no valid conclusions can be drawn from his study.

⁷ Dr. Karcher never tested even a single sample of EZ Seed Bermudagrass or Tall Fescue, and in fact admitted that he did not know how those products would have performed in his trial. (Ex. 20 at 144:18-145:11.) He should not be permitted to opine that his trial disproves the 50% Thicker claim for those untested products. Any such opinion would be entirely speculative. *Daubert*, 509 U.S. at 593 (stating, a "key question" to theory reliability is "whether it can be (and has been) tested"); *Brooks v. Outboard Marine Corp.*, 234 F.3d 89, 92 (2d Cir. 2000) ("The failure to test a theory of causation can justify a trial court's exclusion of the expert's testimony.").

⁸ Even in this methodology, a positive control would have been necessary if all the test plots (those receiving reduced watering) failed to establish, because this still would not have resolved the issue of viability or adaptation to the testing conditions. If at least one of the plots had established properly, however, the viability of the seed would no longer be an issue, and the relative performance of tested seed could be assumed to attributable to a variable other than the seed itself.

Kentucky Bluegrass, creeping red fescue, and perennial ryegrass – the species in the EZ Seed Dr. Karcher tested – are all used primarily in cooler northern climates. (Ex. 9 at ¶¶ 13-15.) Indeed, an agricultural extension paper issued *by Dr. Karcher's employer, the University of Arkansas*, on seeding lawns advises that “Kentucky bluegrass is not well adapted to Arkansas” and that perennial rye is used in Arkansas for “seeding *temporary* lawns overseeding [in winter].” (Ex. 96 at 3 (emphasis added).) It also describes Kentucky bluegrass in more detail:

Kentucky bluegrass is only marginally adapted to northern Arkansas. To help offset its lack of drought tolerance in summer, it can be mixed *with tall fescue which has better drought and heat tolerance*. Ideally, this mixture should be seeded in September so that it has sufficient time to develop before the onset of heat the following summer. *** [H]ybrid bluegrasses have improved heat tolerance *but are not improved enough to consider planting them alone in a lawn*. It is a good idea to plant a mixture of turf-type tall fescue and hybrid bluegrass. It is most convenient to purchase a prepackaged mixture of tall fescue and hybrid bluegrass varieties rather than attempting to blend varieties on your own. A common mixture percentage would be 90 percent tall fescue seed and 10 percent hybrid bluegrass seed by weight.

(Ex. 96 at 5 (emphasis added).)

By contrast, that same publication states “Common bermudagrass and tall fescue are the turfgrasses most commonly established from seed in Arkansas.” (Ex. 96 at 3.) It is also well established in turfgrass science that the effects of reduced water availability vary greatly by seed species. (See Ex. 3 at ¶ 14.) The University of Arkansas extension paper does not even bother to discuss creeping fescues, which are not used in Arkansas. (Ex. 96.)

As a result, when Dr. Karcher elected to test a product that comprises predominately cool season turfgrasses, against a seed mix that was largely tall fescue and ideally suited to Arkansas, he biased his test against EZ Seed, and created a confounding variable that makes his results scientifically unreliable. Dr. Karcher cannot opine on how the same seed in EZ Seed would have performed without the EZ Seed mulch and fertilizer, or that any unique property of the EZ Seed caused its poor performance in his study.

Aside from the difference in species, Dr. Karcher's choice of EZ Seed is highly questionable. Specifically the EZ Seed Sun and Shade "flavor" Dr. Karcher used is not sold in Arkansas precisely because the species in the mix are poorly adapted to the climate; a fact Dr. Karcher should have been able to surmise from his fruitless search for it in both Lowe's and Home Depot. Amazingly, Dr. Karcher passed up the "Tall Fescue" flavor of EZ Seed at both stores. The Tall Fescue flavor, unsurprisingly, contains primarily tall fescue seed with a small amount of Kentucky bluegrass (94.4% of the seed is tall fescue and 5.5% is Kentucky bluegrass), a mix much like that recommended by the University of Arkansas for growth in Arkansas, and similar to the make-up of the "ordinary seed" Dr. Karcher used in his test. (*Compare* Ex. 67 with Ex. 19 at 96.) Dr. Karcher's choice of seeds is indefensible, and introduces confounding variables that render his study unreliable.

c. Dr. Karcher Introduced, but Failed to Control for, Numerous Other Confounding Variables.

In addition, to failing to control for seed viability and the differences in grass species between the tested products, Dr. Karcher also made numerous other decisions in his experimental design that introduced confounding variables, rendering his test unreliable. Specifically, Dr. Karcher introduced the following confounding variables:

Seed count: By varying the species mix being tested, but planting the same weight of pure live seed, Dr. Karcher introduced significant differences in the number of grass seeds being planted. Different species of grass seed weigh different amounts. For example, one pound of Kentucky bluegrass may contain as many as 2.2 million seeds. (Ex. 9 at ¶ 75.) On the other hand, a pound of tall fescue contains approximately 230,000 seeds. (Ex. 9 at ¶ 75.) Thus when Dr. Karcher planted EZ Seed, which contained a high percentage of Kentucky bluegrass, and ordinary seed, which was predominately tall fescue, at the same pure live seed rate, he actually

applied significantly more seeds with EZ Seed. In reduced watering conditions, the extra seeds compete for resources, likely decreasing the chances of successful establishment. (Ex. 9 at ¶ 75) Dr. Karcher made no effort to control this variable.

Mulch: Rather than simply comparing EZ Seed to ordinary seed (as the 50% Thicker claim does), Dr. Karcher applied a straw mulch to his ordinary seed. The straw mulch and coir mulch in EZ Seed are fundamentally different. (See Ex. 48 at ¶¶ 6-11.) Specifically, the coir mulch is highly absorbent to hold and release water back to the seed. (Ex. 48 at ¶¶ 6-11.) The straw mulch does not absorb significant quantities of water, and is not intended to provide moisture to the seed. (Ex. 48 at ¶¶ 6-11.) The relative performance of straw vs. the coir mulch in EZ Seed could be a factor in the performance of the product, but its impact cannot be isolated, because it was not controlled for in Dr. Karcher's experimental design. (Ex. 9 at ¶¶ 114, 165.)

Fertilizer: Dr. Karcher applied a different fertilizer to the ordinary seed than is used in EZ Seed. While this is less likely to have a significant impact on the outcome of the trial, (see Ex. 9 at ¶¶ 99-102), its impact cannot be determined because of the lack of controls.

Raking: Dr. Karcher raked the ordinary seed into the soil, but not the EZ Seed. This difference in treatment creates an additional variable not reflected in the claim, which could have an impact on the performance of the products. (Ex. 9 at ¶ 98.) Absent additional test plots with alternative iterations, proper scientific method would demand that EZ Seed and ordinary seed be treated identically, i.e. not raked in. (Ex. 22 at 40:20-42:7.)

C. Dr. Karcher's Study Fails to Test the Claim at Issue.

Dr. Karcher's growth trial should also be excluded because it does not fit any issue in the case. Specifically, Dr. Karcher's trial was not watered at "half the recommended rate," nor did it not test "ordinary seed," even under his own definition of those terms.

1. Dr. Karcher's Watering Methodology Was Flawed, and Did Not Accurately Represent "Keeping the Soil Moist" or Half That Amount.

The 50% Thicker Claim relates to comparative performance at half the recommended watering rate for ordinary seed. The recommended rate for ordinary seed can be described in a number of ways, such as frequency of watering (*e.g.*, once daily, which is a common rule of thumb given to consumers), or a more subjective standard (*e.g.*, keeping the soil moist). Dr. Karcher opines that [REDACTED] (Ex. 20 at 58:11-14, 96:23-97:10.) In an effort to replicate keeping the soil moist in his experiment, Dr. Karcher watered his "full water control" with 100% ETo on a daily basis. In other words, after an initial watering, Dr. Karcher calculated the ETo for the previous day, and applied that amount to replace the water that was lost to the atmosphere. His half-water treatments received half the volume of water applied to the full water control. But Dr. Karcher's 100% ETo control is grossly inappropriate for the conditions of his trial, does not reliably represent keeping the soil moist, and therefore cannot be considered the "recommended rate" of water. Consequently, his "half water" treatment is fatally flawed.

As described above, ETo is not a measure of actual water loss, but is instead simply an estimate of water lost from an idealized field of complete, dense, actively growing vegetative cover, represented in the equation by a "crop coefficient." The theoretical vegetative cover assumed in ETo – which can be changed, but is turfgrass by default – shades the soil and significantly reduces water lost to the atmosphere. Although the plants themselves lose some water through transpiration, with dense coverage, that amount is less than the amount of water lost from bare soil by evaporation. (Ex. 9 ¶ 27; Ex. 69 at Chapter 1 ("At sowing nearly 100% of ET comes from evaporation, while at full crop cover more than 90% of ET comes from transpiration.")) As noted above, in bare-soil environments, the evaporation increases

dramatically to exceed the evaporation and transpiration in a crop covered environment. Indeed, actual ET for bare soil is more than 20% higher than ETo because of the lack of a crop cover. (Ex. 9 at ¶ 27.)

Virtually every seeding project begins with clearing the area to be seeded, and ensuring there is a flat, bare soil seed bed. (*See, e.g.*, Ex. 67; Ex. 68.) Thus, until the seed establishes into mature turf, a process that takes well over 30 days, the rate of water loss to the atmosphere will be far higher than the ETo calculation. (Ex. 9 at ¶ 27, 30.)

Indeed, ETo replacement *cannot* represent keeping the soil moist. Even if the soil starts moist, ETo underestimates the water lost to the atmosphere by bare soil, which means each watering will leave the soil further and further from the starting moistness as the soil loses more water to the air than is being replaced. As a result, ETo will not “keep the soil moist,” which Dr. Karcher contends [REDACTED] (Ex. 20 at 58:11-14, 96:23-97:10.)

By virtue of using ETo to water bare soil, and making no effort to determine the bare soil ET, Dr. Karcher watered his control plot well below actual ET.⁹ In turn, he watered the half water plots with less than half of actual ET. Thus, even if Dr. Karcher is correct that (1) keeping the soil moist is the recommended rate, and (2) that replacing water lost on a daily basis is a proxy for keeping the soil moist, Dr. Karcher did not apply *half the water lost on a daily basis*. Dr. Karcher’s thus failed to test even his own definition of half the recommended watering rate.

2. Dr. Karcher Failed to Test EZ Seeds’ Performance Versus Ordinary Seed.

Dr. Karcher’s trial purported to test the validity of the claim “50% Thicker With Half the Water** *Versus ordinary seed* when each was watered at half the recommended rate. Results may vary.” (Ex. 19 at 6-7 (emphasis added).) Dr. Karcher and Scotts’ expert Dr. Hopkins agree

⁹ Mulches, like the straw at the rate Dr. Karcher applied to his ordinary seed, may reduce water loss to some degree, but applications conducive to establishing grass seed plantings will reduce water loss less than the complete vegetative cover assumed by ETo. (*See* Ex. 103.)

that in the context of the claim, “ordinary seed” means seed without mulch and fertilizer.¹⁰ (Ex. 20 at 165:11-14 (“[REDACTED]”); Ex. 9 at ¶ 43; Ex. 10 at 218:21-219:6; *see also*, Ex. 47 at 247:15-248:12; Ex. 48 at ¶ 9.)

As a result, Dr. Karcher should have been evaluating whether EZ Seed grew 50% Thicker With Half the Water** **Versus *seed without mulch and fertilizer* when each was watered at half the recommended rate. Instead, Dr. Karcher compared EZ Seed to ordinary seed, *plus mulch and fertilizer*. In other words, Dr. Karcher did not test the claim at issue. And his deviation was material. It is well known that mulch helps retain moisture in the soil surface. (Ex. 19 at 9, 13; Ex. 20 at 201:23-202:2 [REDACTED] [REDACTED] [REDACTED].)

Absolutely no evidence in this case justifies Dr. Karcher’s deviation from the literal language of the claim: “Versus ordinary seed.”¹¹ (*See* Ex. 20 at 164:7-20 (“[REDACTED] [REDACTED] [REDACTED]”).) Dr. Dennis, Plaintiffs’ consumer survey expert did not bother to probe the meaning of “ordinary seed” to consumers. Without such evidence, the literal language of the claim should control.

¹⁰ Even Scotts’ explanation of the 50% Thicker claim to the California Department of Food and Agriculture, drafted in 2009, before EZ Seed was released, explicitly stated, “‘Ordinary seed’ means seed without mulch and fertilizer.” (Ex. 92.)

¹¹ Indeed, the idea behind EZ Seed is that average consumers do not apply fertilizer and mulch to their grass seed. (*E.g.*, Ex. 22 at 40:6-10 (“I would guesstimate that most people in the world don’t realize that fertilizer is needed to grow grass. In fact, you know, they might just go and throw some grass seed there and hope it grows.”).) Thus, the claim addresses EZ Seed versus ordinary seed only, comparing EZ Seed (which is applied by just placing on the bare ground since it contains fertilizer and mulch) to the average consumer’s application of seed. In that scenario, EZ Seed will grow 50% thicker when both are under watered, at half the recommended rate.

Dr. Karcher's deviation from the language of the claim allegedly is based on giving ordinary seed "proper care" using "best practices." (Ex. 19 at ¶ 2.) But this presents the same problem. Nothing in the claim calls for "proper care" for ordinary seed, and again, Plaintiffs provide no evidence to show that consumers would interpret the claim as inclusive of best practices for ordinary seed, let alone what average consumers believe are "best practices."

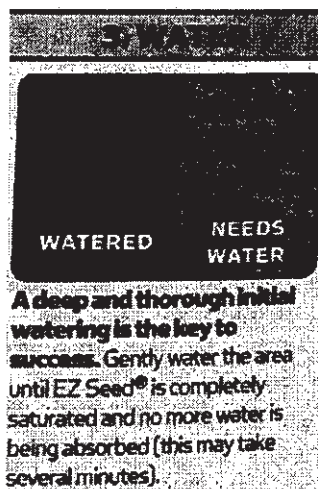
Instead, Dr. Karcher elected to use his own judgement to determine how to care for the ordinary seed in his trial. (Ex. 20 at 179:12-180:2.) He ignored not only the language of the claim, but also how average consumers would actually use grass seed. Scotts' own internal data on consumer use of grass seed shows that only 18% of grass seed users patching a spot in a lawn apply straw mulch. (Ex. 97 at 73.) To this last point, Dr. Karcher admits that [REDACTED]

[REDACTED] Ex. 20 at 60:21-23.) Yet, he acknowledges that [REDACTED] (See, e.g., Ex. 20 at 78:24-79:20.) He even admitted that he [REDACTED] [REDACTED]. (See, e.g., Ex. 20 at 80:19-81:3.)

Dr. Karcher's mulch application *might* be forgivable had he simply been following the ordinary seed directions, but that is not the case either. The Pennington Smart Seed Dr. Karcher used includes detailed planting and care instructions, but it does not even mention mulch, let alone instruct consumers to apply it. (Ex. 68.) Dr. Karcher should have tested the 50% Thicker Claim as stated, without applying additional products to ordinary seed to help retain moisture, and he should not have imposed his personal prospective on proper care. His failures render his test unreliable to evaluate the accuracy of the 50% Thicker claim.

D. Dr. Karcher Did Not Test EZ Seed According To Its Directions For Use.

Since at least 2012, EZ Seed's directions, including those on Dr. Karcher's EZ Seed, stress that a "deep and thorough initial watering" saturating the EZ Seed is "the key to success."¹²



Despite these clear instructions, Dr. Karcher's trial did not start with a deep and thorough initial watering. (Ex. 20 at 182:13-18 (" [REDACTED]
[REDACTED] ■ [REDACTED] [REDACTED]
[REDACTED].)

Dr. Karcher's decision not to provide a thorough initial watering was deliberate, as he already suspected, and the package plainly informed him, that the initial watering was critical to the success of EZ Seed. (Ex. 19 at 40 [REDACTED]
[REDACTED]
[REDACTED]); Ex. 20 at 186:15-24 [REDACTED]

¹² Prior to 2012, EZ Seed's instructions did not contain this same watering instruction, but did instruct consumers to "activate" EZ Seed with water. (Ex. 102; see also Ex. 101 at ¶¶ 13-15.) Dr. Karcher did not contend that he was following the older version of the directions, nor did he even acknowledge their existence in his report or deposition.

[REDACTED]

[REDACTED].)

Of course, the need for a deep and thorough initial watering is no mystery; it is stated clearly on the package; the product needs to be “activated.” Testing EZ Seed without activation is akin to testing the brightness of a lightbulb, without turning it on. Yet Dr. Karcher elected to ignore EZ Seed’s instructions, invalidating his work. (See Ex. 73 (finding Hignight tests of EZ Seed to be invalid for failure to follow current label directions).)

E. Dr. Karcher’s Critique of Scotts’ Trials Improperly Rely on ETo, Including Grossly Unreliable ETo Estimations.

Dr. Karcher opines that the testing performed by Scotts did not properly test the 50% Thicker claim. His opinions rely heavily on his estimation of the ETo during the trials. His opinions on Scotts’ trials are themselves unreliable and should be excluded.

In his report, Dr. Karcher opined that none of the 18 Scotts trials he reviewed ever applied half the recommended rate. (Ex. 19 at 14-16.) To reach this conclusion, Dr. Karcher reports the alleged ETo for the Scotts trials and compared that to the amounts applied in the trials, to show purported overwatering.¹³ But ETo is just as inappropriate here as it is for Dr. Karcher’s own trial. ETo still underestimates actual ET of bare soil plantings by at least 20%, meaning Dr. Karcher’s ET calculations for all the Scotts trials grossly understate the actual ET, and therefore, grossly overstate the percentage of ET applied by Scotts.

Moreover, for six of the eight trials where Dr. Karcher provides ETo, he simply uses publicly available ETo calculations from RainMaster.com – data no reasonable scientist would rely on to reach a reliable scientific conclusion about ET for a particular location at a particular

¹³ For the trial conducted at the University of Florida by Jason Kruse, Ph.D., Dr. Karcher relied on ET data from Florida’s Automated Weather Network, but that data is also ETo rather than actual ET. (See Ex. 19 at pp. 32-33; Ex. 74.) Likewise, the weather station Dr. Karcher used to report “ET” from the University of California Riverside trial discussed on page 33-34 of his report provides only ETo rather than actual ET. (See Ex. 75.)

time. (Ex. 19 at § IV(D)(1)(B); Ex. 20 at 112:18-23 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The Rainmaster.com data are completely divorced from the actual conditions experienced during the Scotts trials. (Ex. 20 at 113:19-24 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]; *id.* at 113:2-12.) Dr. Karcher admits [REDACTED]

[REDACTED] (Ex. 20 at 116:4-20.) Despite this disconnect, Dr. Karcher treats the Rainmaster.com data as conclusive.

An example from more common meteorological data shows the error of Dr. Karcher's approach. According to the National Weather Service, Central Park in New York City averages 4.36 inches of total precipitation in March based on data collected from 1981-2010. (Ex. 76.) In March 2016, however, Central Park actually received 1.17 inches of precipitation, or only 27% of the 30 year average rainfall. (Ex. 76) Assuming a test conducted in central park in March 2016 received 4.36 inches of rain would be wildly inaccurate and unreliable. Yet Dr. Karcher assumes, without further inquiry, that the 30 year average ETo data from Rainmaster.com accurately reflects the actual ET or water loss of Scotts' test plots down to hundredths of an inch. (See Ex. 20 at 113:19-114:1; Ex. 19 at § 4(D)(1)(B).)

But it gets worse. Rainfall measurements are simply that: measurements. ETo is the product of a complex equation with numerous meteorological variables. (See Ex. 69 at Chapter 2 (identifying at least the following factors in determining ETo: net radiation, soil heat flux, vapour pressure deficit of the air, mean air density at constant pressure, specific heat of the air,

the slope of the saturation vapour pressure temperature relationship, psychrometric constant, and the (bulk) surface and aerodynamic resistances.) There are also a number of different equations that can be used to calculate ETo. (Ex. 69) Rainmaster.com uses a proprietary, undisclosed equation, and does not publish the underlying data. As a result, there is no way to evaluate the scientific validity or reliability of the equation or the underlying data. A fact Dr. Karcher candidly admitted:

[REDACTED]

(Ex. 20 at 115:1-16.) No reasonable scientist would rely on 30 year average ETo based on mystery equations utilizing unknown data to reach a definitive conclusion about the conditions of a particular trial. Dr. Karcher's opinions regarding ETo for Scotts' trials based on Rainmaster.com data are unreliable and should be excluded.

F. Dr. Karcher's Trial Is So Flawed That Its Relevance Is Substantially Outweighed by The Prejudicial Effect It Would Have On A Jury.

For all the reasons set forth above, and below, the opinions offered by Dr. Karcher are not reliable. Even if this Court believes Dr. Karcher's missteps go to the weight rather than the admissibility of the evidence under *Daubert*, Dr. Karcher's trial should still be excluded. Dr. Karcher's trial reflecting very poor grass growth on the part of EZ Seed could be highly prejudicial to a jury. Yet for all the reasons set out above, those results are not probative as to

the truth or falsity of the 50% Thicker claim. Consequently, the prejudice caused by Dr. Karcher's results would substantially outweigh their probative value. Fed. R. Evid. 403.

III. CONCLUSION

For the foregoing reasons, Scotts respectfully requests that its motion be granted and Dr. Karcher's report and opinions be stricken and precluded from presentation.

Dated: June 30, 2016
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CERTIFICATE OF SERVICE

I hereby certify that on June 30, 2016 I served a copy of the foregoing, on all counsel of record at the addresses listed below, by email and FTP site.

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